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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/811,824	03/20/2001	George P. Anderson	01997-282001 / MIT Case 8	8422
27890	7590	08/10/2004	EXAMINER KAM, CHIH MIN	
STEPTOE & JOHNSON LLP 1330 CONNECTICUT AVENUE, N.W. WASHINGTON, DC 20036			ART UNIT 1653	PAPER NUMBER

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

SM

Office Action Summary**Application No.**

09/811,824

Applicant(s)

ANDERSON ET AL.

Examiner

Chih-Min Kam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25, 27-56 and 59-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21, 22, 24, 25 and 28-34, 59 and 60 ~~is/are allowed~~: *have allowable subject matter*.
- 6) ☒ Claim(s) 1-20, 27, 35-56 and 61-66 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 7, 23, 37, 38 and 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

1. Claims 1-25, 27-56 and 59-66 are pending.

Applicants' amendment and Declaration of Mouni G. Bawendi filed May 20, 2004 are acknowledged. Applicants' response and Declaration of Mouni G. Bawendi have been fully considered. Claims 1, 21-25, 35 and 59 have been amended, claim 26 has been cancelled, and new claims 59-66 have been added. Thus, claims 1-25, 27-56 and 59-66 are examined.

Rejection Withdrawn

Claim Rejections - 35 USC § 112

2. The previous rejection of claims 21-25, 27-34, 59 and 60 under 35 U.S.C. 112, first paragraph, is withdrawn in view of applicants' amendment of the claim, applicant's cancellation of the claim, and applicants' response at pages 14-16 in the amendment filed May 20, 2004.

Claim Objections

3. Claims 3, 4, 7, 23, 37, 38 and 41 are objected to because the claim contains recitation of non-elected semiconductor materials, e.g., a Group II-V compound for claims 3, 23, 37; AlN for claims 4, 7, 38 and 41.

Claim Rejections-Obviousness Type Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*,

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422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-9, 11-13, 15, 16, 35-43, 45-47, 49, 50, 61, 62, 64 and 65 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10, 16-18, 29-32, 37, 38 and 45-57 of U. S. Patent 6,306,610. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-9, 11-13, 15, 16, 35-43, 45-47, 49, 50, 61, 62, 64 and 65 in the instant application discloses a composition comprising an inorganic particle, a linking group which binds to the outer surface of the inorganic particle and has a first ionizable moiety, and a macromolecule having a second ionizable moiety, wherein the first and the second ionizable moieties associate the inorganic particle with the macromolecule to form an ionic conjugate, and a method of forming the ionic conjugate. This is obvious in view of claims 1-10, 16-18, 29-32, 37, 38 and 45-57 of the patent which discloses a composition comprising a first member of a binding pair; a semiconductor nanocrystal core linked to the first member, and an outer layer including a ligand comprising a multidentate molecule or a molecule having formula of $H_zX((CH_2)_nCO_2H)_y$, where the link between the first member of a binding pair and the nanocrystal comprising a linking group for attachment to the nanocrystal and a second portion comprising a hydrophilic group such as a carboxylate, a sulfonate, a phosphate, a hydroxide or an alkoxide, which links to the first member by hydrophilic or electrostatic interaction, and the first member

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can be a protein. Both the claims of instant application and the claims of the patent are directed to a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a macromolecule having an ionizable moiety, wherein the nanocrystal associates with the macromolecule via ionic interaction. Thus, claims 1-9, 11-13, 15, 16, 35-43, 45-47, 49, 50, 61, 62, 64 and 65 in present application and claims 1-10, 16-18, 29-32, 37, 38 and 45-57 of the patent are obvious variations of a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a macromolecule having an ionizable moiety, the nanocrystal and the macromolecule form an ionic conjugate.

In response, applicants indicate the link is between the first member of the binding pair and the semiconductor nanocrystal, and the ligand, which comprises a multidentate molecule or a molecule having formula of $H_2X((CH_2)_nCO_2H)_y$, is a distinct element of the composition, and not part of the link between the first member of the binding pair and the semiconductor nanocrystal (see Fig. 9); Claim 3 of the '610 patent indicates that the link between the first member of the binding pair and the nanocrystal is an interaction selected from the group consisting of covalent, noncovalent, hydrophobic, hydrophilic, electrostatic, magnetic or coordination through a metal complex. However, there is no teaching or suggestion that the link that can be an electrostatic interaction involves a linking group of any kind. The ligand does not act as a linking group for linking the first member of the binding pair to the nanocrystal; In claims 4 and 5, there is no indication that the link between the second portion of the ligand and the first member of the binding pair involves electrostatic association; Furthermore, there is no teaching or

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suggestion in the claims of the '610 patent of a macromolecule having a charged or ionizable moiety having a plurality of charged or ionizable groups. None of the claims of the '610 patent, whether alone or in combination, teach, suggest, or motivate a person skilled in the art to make a linking group which has a distal end and a proximal end, the distal end being bound to an outer surface of a semiconductor nanocrystal and the proximal end including a first charged or ionizable moiety that electrostatically associates with a second charged or ionizable moiety belonging to a macromolecule (pages 17-20 of the response). The response has been considered, however, the argument is not found persuasive because claim 3 of '610 patent indicates that the link between the first member of the binding pair and the nanocrystal can be electrostatic interaction, claim 4 indicates the ligand comprises a first portion comprising at least one linking group for attachment to the nanocrystal and a second portion comprising at least one hydrophilic group (i.e., a carboxyl, a sulfonate and other ionizable groups, claim 6), and claim 5 indicates the first member of the binding pair is linked to the second portion of the ligand, and claim 7 indicates the first member can be a protein, which is known to contain a plurality ionizable groups such as amino (side chain of Lys) and carboxyl groups (side chain of Gly or Asp). Thus, claims 1-7 describe a composition comprising a first member of a binding pair is linked to a semiconductor nanocrystal via a ligand having a formula of $H_zX((CH_2)_nCO_2H)_y$, where the ligand includes a first portion comprising a linking group, which is attached to the nanocrystal, and a second portion comprising a hydrophilic group (e.g., carboxyl group), which is linked to the first member of the binding pair (e.g., a protein), and the interaction between the nanocrystal and the first member of the binding pair can be electrostatic interaction, thus, the claims of '610 patent does include a

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composition comprising a linking group ($H_zX((CH_2)_nCO_2H)_y$) having one end containing an ionizable group (e.g., carboxyl group), which is electrostatically associated with a macromolecule (e.g., a protein) as the first member of the binding pair, and the other end linked to the nanocrystal, this is not the composition shown in Fig. 9.

5. Claims 1-5, 8, 9, 11-12, 15, 16, 35-39, 42, 43, 45-46, 49 and 50 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-72 of U. S. Patent 6,326,144. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-5, 8, 9, 11-12, 15, 16, 35-39, 42, 43, 45-46, 49 and 50 in the instant application discloses a composition comprising an inorganic particle, a linking group which binds to the outer surface of the inorganic particle and has a first ionizable moiety, and a macromolecule having a second ionizable moiety, wherein the first and the second ionizable moieties associate the inorganic particle with the macromolecule to form an ionic conjugate, and a method of forming the ionic conjugate. This is obvious in view of claims 1-72 of the patent which discloses a composition comprising a compound; a semiconductor nanocrystal linked to the compound by a ligand of the formula of $H_zX((CH_2)_nCO_2H)_y$, wherein the compound can be a protein, a peptide or a nucleic acid, and wherein the link between the compound and the nanocrystal is through hydrophilic or electrostatic association, and the compound has an affinity for a biological target, and the affinity of the compound to the biological target can be hydrophilic or electrostatic attraction. Both the claims of instant application and the claims of the patent are directed to a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a macromolecule having an ionizable

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moiety, wherein the nanocrystal associates with the macromolecule (e.g., a protein) via ionic interaction. Thus, claims 1-5, 8, 9, 11-12, 15, 16, 35-39, 42, 43, 45-46, 49 and 50 in present application and claims 1-72 of the patent are obvious variations of a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a macromolecule having an ionizable moiety, wherein the nanocrystal and the macromolecule have ionic interaction.

In response, applicants indicate the claims of the '144 patent do not teach, suggest, or motivate a person skilled in the art to make a macromolecule having a second charged or ionizable moiety, where the second charged or ionizable moiety includes a plurality of charged or ionizable groups; claim 1 of the '144 patent refers to a compound without further description, and claim 11 indicates compound can be a biological compound, such as "a protein, a peptide, a nucleic acid, a carbohydrate, a cell, a lipid, a cellular organelle, or a signaling molecule", nothing in the claims of the '144 patent teaches or suggests that the compound or any other biological compounds listed includes a charged or ionizable moiety that includes a plurality of charged or ionizable groups (pages 20-21 of the response). The response has been considered, however, the argument is not found persuasive because the protein as the compound is known to contain a plurality of charged or ionizable groups such as amino (side chain of Lys) and carboxyl groups (side chain of Glu or Asp).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it

is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-20, 35-56, 62, 63, 65 and 66 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a protein having an ionizable moiety, wherein the nanocrystal and the protein are linked by an identified linking group to form an ionic conjugate, and a method of forming the ionic conjugate; or a composition comprising a fluorescent semiconductor nanocrystal, associated with a compound that has affinity and can physically interact with a biological target as indicated in the prior art, does not reasonably provide enablement for a composition comprising an inorganic particle, a linking group which binds to the outer surface of the inorganic particle and has an ionizable moiety, and a macromolecule having an ionizable moiety, wherein the inorganic particle and the macromolecule are linked by a linking group to form an ionic conjugate, and a method of forming the ionic conjugate, where the inorganic particle and the macromolecule are not defined. The specification does not enable a person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Claims 1-20, 35-56, 62, 63, 65 and 66 are directed to a composition comprising an inorganic particle, a linking group, and a macromolecule or a fusion protein, wherein the inorganic particle and the macromolecule are linked by the linking group to form an ionic conjugate, and a method of forming the ionic conjugate. The specification, however, only discloses cursory conclusions without data supporting the findings, which states that

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the inventions relates to ionic conjugates including inorganic particles and macromolecules useful in detecting the presence or absence of specific species such as for detecting a biological target, and an ionic conjugate forms through self-assembly in which inorganic particles electrostatically associate with at least one macromolecule (page 1, lines 11-13; page 2). There are no indicia that the present application enables the full scope in view of an ionic conjugate comprising an inorganic particle, a linking group, and a macromolecule, and a method of making the ionic conjugate as discussed in the stated rejection. The present application does not provide sufficient teaching/guidance as to how the full scope of the claims is enabled. The factors considered in determining whether undue experimentation is required, are summarized in In re Wands (858 F2d at 731,737, 8 USPQ2d at 1400,1404 (Fed. Cir.1988)). The factors most relevant to this rejection are the breadth of the claims, the presence or absence of working examples, the state of the prior art and relative skill of those in the art, the predictability or unpredictability of the art, the nature of the art, the amount of direction or guidance presented, and the amount of experimentation necessary.

(1). The breadth of the claims:

The breadth of the claims is broad and encompasses unspecified variants regarding inorganic particles and the macromolecules in the ionic conjugates, where the make/use of ionic conjugates are not adequately described or demonstrated in the specification.

(2). The absence or presence of working examples:

There are no working examples indicating the claimed variants except for an ionic conjugate of semiconductor nanoparticles (CdSe-ZnS-dihydrolipoic acid) with Maltose

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binding protein (MBP)-leucine zipper fusion protein or with protein G-leucine zipper fusion protein (pages 22-29).

(3). The state of the prior art and relative skill of those in the art:

The prior art indicates a composition comprising a fluorescent semiconductor nanocrystal associated with a compound that has affinity and can physically interact with a biological target (Bawendi *et al.*, U. S. Patents, 6,306,610 and 6,326,144). However, the general knowledge and level of the skill in the art do not supplement the omitted description, the specification needs to provide more teachings on the make and use of ionic conjugates containing various inorganic particles, linking groups, and various macromolecules to be considered enabling for the claimed method.

(4). Predictability or unpredictability of the art:

The specification has shown the make of ionic conjugates of semiconductor nanoparticles (CdSe-ZnS) with Maltose binding protein (MBP)-leucine zipper fusion protein or with protein G-leucine zipper fusion protein (pages 22-29). However, the specification does not provide the make/use of ionic conjugates containing various inorganic particles, linking groups and various macromolecules, the invention is highly unpredictable regarding the effects of these ionic conjugates.

(5). The amount of direction or guidance presented and the quantity of experimentation necessary:

The claims are directed to an ionic conjugate comprising an inorganic particle, a linking group, and a macromolecule, and a method of forming the ionic conjugate. The specification has shown the make of ionic conjugates of semiconductor nanoparticles (CdSe-ZnS-dihydrolipoic acid) with Maltose binding protein (MBP)-leucine zipper

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fusion protein or with protein G-leucine zipper fusion protein (pages 22-29). However, the specification has not demonstrated the making and use of various ionic conjugates containing different inorganic particles, linking groups and different macromolecules. There is no working example indicating the claimed variants except for an ionic conjugate of a semiconductor nanoparticle (CdSe-ZnS-dihydrolipoic acid) with a fusion protein. The specification has not provided sufficient teachings on the make/use of various ionic conjugates, which are encompassed by the claims. Since the specification fails to provide sufficient teaching on the make/use of ionic conjugates containing various inorganic particles, linking groups and macromolecule, it is necessary to carry out further experimentation to assess the effects of various ionic conjugates in biological use.

(6). Nature of the Invention

The scope of the claims encompasses various ionic conjugates, but the specification does not provide sufficient teachings on the make/use of these ionic conjugates and the effects of these conjugates. Thus, the disclosure is not enabling for the reasons discussed above.

In summary, the scope of the claim is broad, the working example does not demonstrate the claimed variants, the art is unpredictable regarding the effects of the conjugates, and the teaching in the specification are limited, therefore, it is necessary to have additional guidance and to carry out further experimentation to assess the effects of these ionic conjugates.

In response, applicants indicate inorganic particles are described at pages 9-10 in the specification at, in particular, the specification indicates that inorganic colloids include Ag, Au, or a phosphor (page 9, lines 27-30), and inorganic colloids including Au

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are described in WO 98/04740, which is one example of inorganic particles known in the art, thus, a person skilled in the art, upon reading the specification and using the knowledge in the art, would be able to make and use the inorganic particles; the independent claims have been amended to describe the linking group; regarding "macromolecule" which is defined in the dictionary as "a very large molecule, such as a polymer or protein, consisting of many smaller structural units linked together", a person of ordinary skill in the art would recognize that organic polymers, nucleic acids, and polypeptides are all examples of macromolecules. The specification provides further description of ionic conjugates that include a non-protein macromolecule can be found at page 17, lines 9-19 and page 14, and claims 1 and 35 refer to the macromolecule including a second charged or ionizable moiety having a plurality of charged or ionizable groups (pages 14-16 of the response). The response has been fully considered, however, the argument is not found persuasive regarding the inorganic particles and macromolecules because the claims are directed to an ionic conjugate comprising an inorganic particle, a linking group and a macromolecule, where the inorganic particle and the macromolecule are not identified, while the specification only disclose the make/use of an ionic conjugate comprising a semiconductor nanocrystal and a protein, which are linked by a linking group (e.g., ionic conjugates of a CdSe-ZnS semiconductor nanoparticle with a fusion protein), it does not disclose how to make and use unidentified ionic conjugates containing an inorganic particle, a linking group and a macromolecule with various structural features, which are encompassed by the claims but not sufficiently described in the specification. Thus, the full scope of the claim is not enabled. As indicated in the section above, the description of inorganic particles and macromolecules

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(pages 9-14), and the working examples (pages 22-23) in the specification are mainly directed to an ionic conjugate comprising a semiconductor nanocrystal, which can be used for detecting a biological target (page 1, lines 11-13), however, the claims are directed to unidentified ionic conjugates containing various inorganic particles, linking groups and macromolecules, where the make, the effect, and the use of these conjugates are not described in the specification, thus, it requires additional guidance to carry out further experimentation to assess the effects of these ionic conjugates in biological use. Regarding the linking group and the fusion protein, the argument is persuasive, thus the rejection against claims 21-25, 27-34, 59 and 60 are withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 11, 27 and 45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11, 27 and 45 are indefinite because the claim has the same scope as the independent claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 1-9, 11-13, 15, 16, 35-43, 45-47, 49, 50, 61, 62, 64 and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Bawendi *et al.* (U. S. Patent 6,306,610, filed September, 1999; see whole document including the claims).

Bawendi *et al.* teach a composition comprising a fluorescent semiconductor nanocrystal having an overcoating layer, associated with a compound that has affinity and can physically interact with a biological target such as proteins, nucleic acids, cells and subcellular organelles, wherein the affinity is hydrophilic, ionic or electrostatic attraction (column 4, line 7-column 5, line 8; claims 1, 2, 15, 16, 35, 36, 49, 50, 61, 64), and wherein the compound having at least one linking group attached to the overcoating layer and at least one hydrophilic group has the structural formula (I), (II), (III) or (IV), where the hydrophilic group may be a charged group such as carboxylates, sulfonate, phosphates or ammonium salts (column 15, line 66-column 18, line 53; claims 8, 9, 11-13, 42, 43, 45-47, 62, 65). The semiconductor nanocrystal includes a core surrounded by a semiconductor shell, and the core and the shell can be a semiconductor material including those of Group II-VI, e.g., CdSe and ZnS (column 6, lines 14-37; claims 3-7 and 37-41).

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9. Claims 1-5, 8, 9, 11-12, 15, 16, 35-39, 42, 43, 45-46, 49 and 50 are rejected under 35 U.S.C. 102(e) as being anticipated by Bawendi *et al.* (U. S. Patent 6,326,144, filed September, 1998; see whole document including the claims).

Bawendi *et al.* teach a composition comprising a fluorescent semiconductor nanocrystal having an overcoating layer, associated with a compound that has affinity and can physically interact with a biological target such as proteins, nucleic acids, cells and subcellular organelles, wherein the affinity is hydrophilic, ionic or electrostatic attraction (column 3, line 31-column 4, line 4; claims 1, 2, 15, 16, 35, 36, 49 and 50), and wherein the compound having at least one linking group attached to the overcoating layer and at least one hydrophilic group, has the structural formula $H_zX((CH_2)_nCO_2H)_y$, where the hydrophilic group is carboxylate (column 7, line 66-column 8, line 51; claims 8, 9, 11-12, 42, 43 and 45-46). The semiconductor nanocrystal includes semiconductor materials of Group II-VI, e.g., CdSe and ZnS (column 6, lines 14-37; claims 3-5 and 37-39).

In response, Declaration of inventor Mounji G. Bawendi has been filed, which indicates he is a co-inventor of the instant application and U.S. Patents 6,306,610 and 6,326,144, and the '610 and '410 patents were cited against the instant application. The Declaration further indicates the other co-inventors of the '610 and '410 patents are Frederic V. Mikulec and Vikram C. Sundar. Sundar and he, along with other co-inventors, prepared and tested the ionic conjugates described in the instant application. Mikulec, while a co-inventor of the subject matter claimed in the '610 patent and the '144 patents is not a co-inventor of the subject matter claimed in the instant application, and Mikulec was not involved with any discovery or development of the concepts with regard

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to a composition including an inorganic particle electrostatically associated with a macromolecule. Applicants also indicates Declaration of inventor Mouni G. Bawendi states "Mikulec was not involved with any discovery or development of the concepts with regard to a composition including an inorganic particle electrostatically associated with a macromolecule."; Any disclosure in the '610 patent or the '144 patent relevant to the instantly claimed ionic conjugates is the work of the three co-inventors named in present application, thus, the neither the '610 patent nor the '144 patent qualifies as prior art under 35 U.S.C. § 102(e). The response and the Declaration have been considered, however, the argument is not found persuasive because '610 patent or the '144 patent has different inventive entity (Frederic V. Mikulec and Vikram C. Sundar and Mouni G. Bawendi) from the instant application (George Anderson, Hedi Mattoussi, Matthew Mauro, Vikram C. Sundar and Mouni G. Bawendi), thus, the rejection is proper under 35 U.S.C. 102(e) (see the statutory statement shown above).

Conclusion

11. Claims 1-20, 27, 35-56 and 61-66 are rejected, claims 3, 4, 7, 23, 37, 38 and 41 are objected, it appears claims 21, 22, 24, 25 and 28-34, 59 and 60 have allowable subject matter.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached at 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

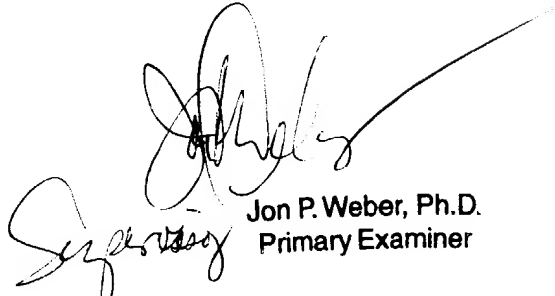
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Chih-Min Kam, Ph. D. *CMK*

Patent Examiner

CMK

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Jon P. Weber, Ph.D.
Primary Examiner